discussions on the ethnology of the Japanese, their language and literature. Sir Edward does not profess to know all these subjects at first hand, but has, with perhaps only one exception, chosen for his guidance the most trustworthy authorities attainable. Sir Edward gives several examples of what the Japanese language is capable of in the way of poetry; we have space for only one specimen:—

"Types of our children are the tiny grasses,
Tender and frogile in the ample moorland:
We know n.' to what fragrance their infant sprouts may blossom,
Nor wist to what sweetness their unborn fruits may ripen,
But hoping ever wait till autumn tells their story.
Oh! cherished children, may ye never perish,
Flowerless, fruitless, in the early springtime,
Nor like this petal trampled by the wayside,
Fall in the fuller promise of your prime."

A people that are capable of thinking and writing thus deserve better than to be laughed at.

Sir Edward Reed left Japan with the highest respect for the people and their efforts to bring themselves abreast of the civilisation of Europe and the United States, and with a firm belief in the determination and earnestness of the Emperor and his ministers. He evidently is strongly of opinion that the new phase upon which Japan has entered is no mere spurt which will collapse in a few years, but a permanent change for the better in the direction of the civilisation of the country. That the result will be a complete assimilation to European ways, as some people seem to think and hope, is not to be wished for and not in the nature of things to be expected. With all their admiration for the science and the arts of Europe, the Japanese respect themselves sufficiently to see that there is much in their old civilisation that may well be retained. Indeed the problem is one of the meeting of two forces. A new force from an entirely different direction has struck in upon the course of the old civilisation, with the result of a permanent change of direction; but that change cannot be entirely in the direction of the new force. Nor will the final result be a lapse back into the old ways; even in the brief period since the country was opened to European influence the change has been so wide and deep that any such lapse is inconceivable. Those who are in the habit of decrying the country tell us that the Japanese are everything by turns and nothing long; their upwards of 2,000 years of gradual development in one direction, and their steady continuance in the course entered upon about fifteen years ago, belies the sneer, which probably owes its origin to that official quarter whose contemptuous treatment of the Japanese Government Sir Edward Reed so strongly laments. We earnestly hope that the Japanese will go on during the next fifteen years as they have done in the past, and by that time the current in the new channel will be so broad and powerful that it will require a force of equal power to seriously change its direction, and we do not know where that is to come from. The problem in national development being worked out by the Japanese is of the highest possible interest, and what is its real nature cannot be better learned than from the two valuable volumes which so busy a man as Sir Edward Reed has found time to put together.[1]

NOTES

THE foundation-stone of the new museum of McGill College, Montreal, to which we referred some time ago, was laid on September 21 by the Marquis of Lorne. Principal Dawson in thanking Mr. Redpath, the donor, for his generous gift, stated that the museum would be not merely a place for the exhibition of specimens, but a teaching instrument and a laboratory of original research; a great natural science department of the University, in which the classes in geology and biology would receive their instruction, original workers would be trained in all departments of natural science, and from which would go forth the men—and, he trusted, the women also—best fitted to bring to light the hidden treasures of the Dominion, and to avert by the aid of science the injuries with which any of its industries might be threatened. Dr. Dawson referred to other noble examples of private local or national liberality on the American continent, besides those of which Montreal can boast—to "the great National Museum at Washington, which is intended to rival, and if possible surpass, the British Museum; the Central Park Museum of New York, on which that great city has lavished vast sums of money; the Zoological Museum of Harvard, whose revenues would suffice to support some entire universities in this country; or the foundations of Mr. Peabody, which have established great museums in several American cities." And he hoped that this latest gift to Montreal would stimulate other benefactions, especially for their Faculty of Applied Science, so that the physical apparatus and class-rooms of the University might be as well provided for as their natural science collections.

MR. MERRIFIELD, F.R.S., the retiring president, proposes at the annual meeting of the London Mathematical Society on November 11, to cast his valedictory address into the form of "Considerations respecting the Translation of Series of Observations into Continuous Formulæ." The following is the proposed new Council:—Mr. S. Roberts, F.R.S., president; Dr. Hirst, F.R.S., and Mr. J. W. L. Glaisher, F.R.S., vice-presidents; Mr. C. W. Merrifield, F.R.S., treasurer; Messrs. M. Jenkins and R. Tucker, honorary secretaries; other members, Prof. Cayley, F.R.S., Mr. H. Hart, Prof. Henrici, F.R.S., Dr. Hopkinson, F.R.S., Mr. A. B. Kempe, Mr. R. F. Scott, Prof. H. J. S. Smith, F.R.S., Messrs. Lloyd Tanner, H. M. Taylor, and J. J. Walker.

WE take the following from the New York "Monthly Index to Current Periodical Literature," &c.:—"The new Warner Observatory which is being erected at Rochester, N.Y., is attracting much attention in social and literary as well as scientific circles. The new telescope will be twenty-two feet in length, and its lens sixteen inches in diameter, thus making it third in size of any instrument heretofore manufactured, while the dome of the Observatory is to have some new appliances for specially observing certain portions of the heavens. It is to be the finest private observatory in the world, and has been heavily endowed by Mr. H. H. Warner. Prof. Swift has laboured under numerous disadvantages in the past, and the new comet which he recently found was in spite of many obstacles; but as the new institution is to be specially devoted to discoveries, there are good reasons to expect very many scientific revelations in the near future from the Warner Observatory at Rochester."

THE *Times* has shown considerable pluck in having erected at its office one of Mr. Jordan's glycerine barometers, described in NATURE, vol. xxi. p. 377. In the issue of the 25th inst. and following days are published the readings of this gigantic barometer at intervals of two hours from 2 p.m. to 2 a.m. This will be continued regularly, a second edition of the paper giving the two-hourly readings from midnight to noon. These daily records with a barometer on such an enormous scale will be of the greatest value. The *Times* rightly states that it seems unquestionable that an instrument of this kind is admirably suited for practical use at meteorological stations, at seaports, in collieries, and in all other situations where it is of importance for the unpractised eye to notice frequently and easily the changes taking place in atmospheric pressure.

[1] For the illustrations in this article we are indebted to the courtesy of Mr. Murray.

THE results of the observations made from the two balloons sent up from the Crystal Palace on Thursday last have not yet been discussed. But it may be stated that the direction of the wind was remarkably steady, as during the run the two balloons were constantly kept in view of each other in spite of the want of light and transparency of air. This result is all the more to be noted that the variations in the altitude of the two balloons were frequent and considerable, 0 to 5000 feet. The variation of temperature did not amount to more than 5° C. between the maximum of the readings and their minimum. A peculiar current was observed just on arriving on the coast, which is usual under such circumstances. The composition of the clouds was very complex. First, a layer of transparent fog covered almost the whole of the land and gave a watery appearance to it; second, cumuli described as analogous to pulled bread were floating at a height of 1000 metres and descended gradually as the sun was nearing to the horizon; and lastly, a large number of parallel strati stretching south-westerly in the direction of the sun, and seemingly diverging from it. The velocity of the wind was about half a mile per minute, and pretty well determined by observers located in one of the two towers of the Crystal Palace. As to the prognostication of the route, it was nicely done by Mr. Coxwell, who told M. de Fonvielle that he should land between Portsmouth and Winchester. A question arose between M. de Fonvielle and Commander Cheyne about the bearing, the latter's compass having been reversed by an optical illusion, but the azimuth was given with great accuracy, and the uncertainty between the two would not have lasted for a minute if the possibility of the error could have been ascertained. The swinging of the balloon round its axis was sufficient to prevent the use of a new compass designed on purpose for aëronauts.

IT has been represented to us that in our notice of Prof. Owen's work the statement that "he was lecturer on palæontology at the School of Mines in Jermyn Street in 1856" may lead to a misapprehension. We have therefore to state that although Prof. Owen delivered a course of lectures in the theatre of the School of Mines in the year in question, he held no appointment in that institution.

MR. GRAHAM BELL has been honoured in the scientific, as well as other circles of Paris during the past week. He exhibited his photophone at the establishment of M. Antoine Breguet and elsewhere, and was the object of much curiosity wherever he went as "l'homme qui fait parler la lumière."

AT the opening meeting of the Geologists' Association on November 5, the president, Prof. Rupert Jones, will read a paper on the origin and progress of that society.

THE next number of the Victoria Philosophical Institute's *Journal* is announced to contain papers by Prof. Stokes, F.R.S., Prof. Hughes of Cambridge, Prof. Nicholson, M.D., F.R.S.E., of St. Andrew's, and Dr. Hormuzd Rassam, with maps and details of his discoveries.

MR. FLETCHER of Warrington has sent us a specimen of a new gas-heating burner which seems well adapted for many purposes and trades which are as yet unsupplied with satisfactory heating apparatus. It seems to us to have all the advantages claimed for it by Mr. Fletcher. It has from three to four times the power of any burner similar in appearance; the flame is *solid*, intensely hot, and perfectly free from smell; it gives a duty higher than the calculated theoretical maximum for the gas consumed, and it cannot be damaged by the dirtiest work. In case the perforated copper dome gets choked with dirt, it can when the burner is warm be lifted off and washed or brushed clean. Any liquid spilt so as to get inside the burner flows out by the side tube without the possibility of damaging the burner. The body of the burner is cast all in one piece, without a joint, thus doing away with one great fault, causing liability to leakage in most of the burners at present in use. Altogether this burner seems to be one of the greatest advances yet made in the practice of heating by gas. Mr. Fletcher has also sent us a useful practical paper on Heating (including cooking) by Gas, read the other day before the Philosophical Society of Glasgow.

PART iii. is to hand of the magnificent "Bedfordshire Pomona," the illustrations of the apples and pears in which continue to be as numerous and life-like as ever, so much so as to make one's mouth water. The papers in this part are on "The Crab, its Characteristics and Associations," by Mr. Edwin Lees, F.L.S.; "The Orchard, its Products: Cider and Perry," by the Rev. C. H. Bulmer; the latter a paper of considerable length, minute detail, and great practical value. Mr. David Bogue is the London publisher.

AMONG the lectures to be given this winter at the Museum and Library, Queen's Road, Bristol, are the following:—November 22, Prof. S. P. Thompson, B.A., D.Sc., "The Rainbow," illustrated with experiments by the electric light; January 17, 1881, Prof. Rolleston, M.A., M.D., F.R.S., F.L.S., Linacre Professor of Anatomy and Physiology, Oxford, "The Early Races of the British Isles"; January 31, Sir John Lubbock, Bart., M.P., F.R.S., F.L.S., "Fruit and Seeds"; February 14, Rev. J. M. Wilson, M.A., F.R.A.S., Head Master of Clifton College, "Double and Multiple Stars"; February 28, Dr. W. H. Stone, F.R.C.S., Lecturer on Physics at St. Thomas's Hospital, "The Measurement and Determination of Musical Pitch," illustrated with experiments; March 14, Prof. W. J. Sollas, M.A., F.R.S.E., F.G.S., Curator of the Bristol Museum, "Coal and the Bristol Coalfields."

WE have received the Catalogue of the General Lending Department of the Newcastle-on-Tyne Public Library, a very thick volume, with a much thinner one containing a list of the books of the Juvenile Lending Department. We may notice them more at length in a future number.

WE have received a very favourable Sixth Annual Report from the West London Scientific Association and Field Club, which commenced its new session on the second Tuesday of this month.

THE *Reports* of the Dunedin (N.Z.) Naturalists' Field Club for 1878-80 are, we regret to see, desponding. It finds some difficulty in keeping up the interest of its members, rather a strange thing in the land of the New Zealand Institute. The Report contains catalogues of the indigenous and introduced flowering plants occurring in the Dunedin district.

ON September 23 Rangoon was visited by three distinct shocks of earthquake; all parts of the province had previously been visited by shocks. A shock of earthquake lasting two seconds was felt at Cordova on the 21st inst., accompanied by a loud subterraneous rumbling. A slight shock, lasting six seconds, was also felt at Madrid on the same day. The shock was stronger in the centre of the city than in the outskirts, and shocks occurred in several towns of the province of Zamora, but no damage has been done. On the same date a shock, the after effects of which were felt in almost every part of the country, occurred both at Lisbon and Coimbra, without however doing any damage.

IT is stated that at the National Exhibition to be opened at Milan next year there will be a captive balloon, on the model of the one which was so successful in Paris in 1878. It will measure not less than 180 feet in circumference, 84 feet in height, and contain 15,000 cubic feet of gas. To it will be

attached a safe and solid car, capable of containing seats for at least eight persons. A steam-engine is to regulate the ascent and descent, and it will rise to a height of about 900 feet, affording a splendid view of Milan and the plains of Lombardy. The balloon will be constructed at Milan, M. Henri Beudet, the well-known and experienced aëronaut, having been sent for to direct the work.

THE coal-beds on the Souris River, Manitoba, have proved very rich, and are to be developed during the winter.

THE Japan papers call attention to the almost limitless mineral wealth lying dormant in the country, and which is only waiting for development to become a profitable source of revenue. Of coal there is an abundant supply, but only the Takashima mine has been fitted with modern appliances. There are several other coal mines which are only unprofitable because improperly worked, and now it is averred that Prof. Atkinson during a sojourn in the Mitake Mountains of the Koshu Province has discovered another valuable deposit of coal.

MR. NORTH, who was sent by the Natal Government to examine the Newcastle coal-fields, has reported favourably on the quantity and quality of the coal.

ON Friday evening, October 22, previous to distributing at the Manchester Mechanics' Institute the prizes and certificates gained by the students at this year's Science and Arts, Society of Arts, City and Guilds of London Institute, and Union of Lancashire and Cheshire Institute's examinations, Prof. Ayrton delivered an address on Technical Education and on the future of Mechanics' Institutions. Of the two original objects for which Mechanics' Institutions were established fifty years ago, to provide clubs for artisans and places for giving popular scientific lectures, it was shown that the latter had to a great extent been abandoned; also that the mere novel utility of such institutions in furnishing the means for the holding of science and art classes would also be taken away from them when the teaching of elementary science became the duty of our elementary schools. There remained, however, for Mechanics' Institutions a great new field of activity in the teaching of applied science to mechanics, not the teaching of abstract scientific principles and the applications only perhaps afterwards, but the teaching of these scientific principles *through* the apparatus in use in daily life; in fact, that Mechanics' Institutions could well furnish the machinery by means of which numerous technical classes throughout the country which were so much needed could be rapidly established, the money voted by the City and Guilds of London Institute as payment on the results of the technological examinations, together with funds locally subscribed, furnishing the motive power. What the lecturer thought technical teaching should consist of was illustrated by the kind of work now going on at the temporary laboratories of the City Guilds Institute at Finsbury; stress was laid on the fact that there were no distinct students' fees there for laboratory work and for lectures, but that every fee, small as it was, entitled each student to at least two hours' practical work in the laboratories for every one hour of lecture; so that in fact all the 150 students had laboratory work which did not consist in the mere repetition of qualitative lecture experiments, but in the making of accurate quantitative measurements, all bearing as far as possible directly on each student's trade. Of this practical illustrations were given. Prof. Ayrton concluded by warning technical instructors from attempting to follow ordinary college methods of *synthetical* teaching, which, although most valuable for a young lad prepared to spend several years at college, was quite unsuitable for an artisan engaged all day in following his trade. Technical education, he considered, must be distinctly *analytical*—the complete machine as the artisan knew it must be taken at once, and the science developed, so to say, from the machine itself; and that it was men with a good practical knowledge of their trade and with an aptitude for science rather than men versed in science, but with only a mere book knowledge of industries, that were wanted both as candidates for the technological examinations and as students to be trained up as technical instructors.

IN the note on the late Dr. Sparks in NATURE, vol. xxii. p. 591, for Dr. King's "Therapeutics" read Dr. Binz's "Therapeutics."

THE additions to the Zoological Society's Gardens during the past fortnight include a Macaque Monkey (*Macacus cynomolgus*) from India, presented by Mr. W. B. Tustin; two Polar Bears (*Ursus maritimus*), an Ivory Gull (*Larus eburneus*) from the Arctic Regions, presented by Mr. Leigh Smith, F.Z.S.; a Crested Porcupine (*Hystrix cristata*) from India, presented by Mr. W. Middleton; three Gaimard's Rat Kangaroos (*Hypsiprymnus gaimardi*) from Australia, presented by Mr. A. B. Gow; a — Brocket (*Cariacus sp. inc.*), a White-bellied Opossum (*Didelphys albiventris*), a Brazilian Hare (*Lepus brasiliensis*) from Quipapà, Pernambuco, a White-bellied Guan (*Ortalida albiventris*), a Black Tortoise (*Testudo carbonaria*) from Garanhuns, presented by Mr. W. A. Forbes, F.Z.S.; a Frigate Bird (*Fregata aquila*) from Fernando de Noronha, presented by the Rev. G. Bayldon; a Yellow-headed Conure (*Conurus jendaya*) from Pernambuco, presented by Mr. C. A. Craven; two American Black-backed Geese (*Sarcidiornis carunculata*) from the Sertoes of Pernambuco, presented by Miss Davis; a White-throated Finch (*Spermophila albogularis*) from Pernambuco, presented by Mr. S. Jones; a Herring Gull (*Larus argentatus*), British, presented by Mr. J. Palmer; a Horrid Rattlesnake (*Crotalus horridus*) from Quipapà, Pernambuco, presented by Mr. H. E. Weaver; a Bonnet Monkey (*Macacus radiatus*) from India, a Black Iguana (*Metopoceros cornutum*) from Galapagos (?), deposited; a Rock Cavy (*Ceredon rupestris*), a Green-winged Trumpeter (*Psophia viridis*), a White-bellied Parrot (*Caica leucogaster*), a Red-vented Parrot (*Pionus menstruus*), two Golden-headed Parrakeets (*Brotogerys tui*), two Toco Toucans (*Ramphastos toco*), an Orinoco Goose (*Chenalopex jubata*) from Brazil, a Rufous Pigeon (*Columba rufina*), a Yarrell's Siskin (*Chrysomitris yarrelli*), two Scaly Doves (*Scardafella squamosa*) from Parahyba, three Picazuro Pigeons (*Columba picazuro*), a Black Tanager (*Tachyphonus melaleucus*), a Black-headed Tanager (*Orchesticus ater*), a Passerine Ground Dove (*Chamœpelia passerina*), three Yellow-shouldered Hangnest (*Icterus tibialis*), from Pernambuco, a Brazilian Tanager (*Ramphocœlus brasilius*), a Blue and Black Tanager (*Calliste brasiliensis*) from Bahia, a White-eyebrowed Guan (*Penelope superciliaris*) from Panellas, four Cactus Conures (*Conurus cactorum*), two Banded Tinamous (*Crypturus noctivagus*), seven Tataupa Tinamous (*Crypturus tataupa*) from Garanhuns, a Great-Billed Rhea (*Rhea macrorhyncha*) from Agoas Bellas, Pernambuco, two Orchard Hangnests (*Icterus spurius*), a Baltimore Hangnest (*Icterus baltimore*) from North America, purchased; two Squirrel-like Phalangers (*Belideus sciureus*), born in the Gardens; a Macaque Monkey (*Macacus cynomolgus*) from India, presented by Mr. F. W. Manley; a Dunlin (*Tringa cinclus*), a Sanderling (*Calidris arenaria*), British, presented by Mr. Edmund Elliot, M.R.C.S.; a Horned Lizard (*Phrynosoma cornutum*) from Texas, presented by Mr. W. C. Boyd; a Waxwing (*Ampelis garrulus*), European, deposited; a Black Saki (*Pithecia satanas*) from Lower Amazons, a Roseate Spoonbill (*Platalea ajaja*), a Great-billed Rhea (*Rhea macrorhyncha*) from South America, purchased.

OUR ASTRONOMICAL COLUMN

CERASKI'S VARIABLE OF SHORT PERIOD.—It will be seen from a letter which Prof. Pickering, the Director of the Observatory of Harvard College has addressed to us, that, contrary to